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Bates/Draft 4-3-68
Suggested Remarks for Mr. Webb
Dinner Speech, Rotarians of Goldsboro, N.C.
April 5, 1968

Thank you for the opportunity to be back in North Carolina, ~~my old home state~~. Any request from Jim Webb Warren will always be an answer "yes". Even when the trip must be as brief as this one, it is good to be able to visit with Eastern Carolina ~~community~~ leaders and old friends who are so deeply interested in keeping ~~the~~ Tarheels ~~North State abreast of the latest developments~~ up to date in our rapidly changing world.

~~As a native of this state, I appreciate the services that~~ Organizations such as ~~this one are rendering to~~ Rotary helps all of us keep high standards ~~of excellence~~ and to make them even higher in our South. ~~As representative of a national agency which~~ We who work at NASA constantly seeks to put the new knowledge and the new technology of aeronautics and space to use for the benefit of all men, and I am pleased to say that a special program set up here in North Carolina for this purpose has been meeting with a

great deal of success. I refer to the North Carolina Science and Technology Center, which is one of a ~~very~~ small number of university or nonprofit research groups which operate regional dissemination centers ~~under contract to the National Aeronautics and Space Administration. These centers are a~~ as part of the NASA Technology Utilization Program, ~~whose~~ The purpose is to make the results of space research known to industry, the medical profession, and other non-aerospace users.

These are the kinds of efforts whose benefits far transcend initially established goals; space research has proved to be a catalyst to the total technological advance of the United States. ~~As we strive to achieve the difficult goals we have set for this nation in space,~~ In space, we have gained new knowledge, developed new materials and products, learned new ways of doing and building, created new industries, and provided new jobs. These new findings are being disseminated ~~here and in neighboring areas~~ to be put to practical use.

As ~~your~~ North Carolina's participation in the program increases, we hope that more and more you will be able to apply this know-how to help solve ~~the~~ problems and satisfy the needs ~~of our home state~~. ~~There is no reason that the~~ North Carolina ~~State~~ cannot have as

much progress as a frontier of science and technology as it had in the early days when it was a literal frontier to be conquered by the pioneering spirit.

~~NASA is relying on this area for many other aspects~~ of our space program ~~as well~~. As of January of this year, ~~for example,~~ North Carolina State University held NASA research and training grants totaling $1,673,000 dollars, with research being conducted in such fields as electrical engineering, mechanical engineering, mathematics, physics, and genetics. And in one of your areas of very special competence, NCSU's School of Textiles has performed useful research on wash cloths for astronauts.

NASA research at Duke University has reached a cumulative total of $1,607,000; at the University of North Caroline, the figure is $1,156,000.

In all, again as of January 1968, cumulative totals of $6,577,000, for 52 contracts, have been awarded in the State of North Carolina.

We have been particularly interested in the work that goes on in the Research Triangle, run by all three of the universities I have mentioned. Here is one of the best examples ~~I know of anywhere in the East~~ of the cooperative efforts of Government, industry, and the university community--

the kind of teamwork that has made our national space program possible.

Because of this kind of teamwork, we can point to some very real and important accomplishments. In this period of many problems, we as a nation must be very careful not to let our real and necessary concerns with today's difficult problems -- the world economic situation, the gold crisis, the conflict in Vietnam, the problems of our cities -- all these serious and important concerns must not be permitted to undercut the fundamental bases of our national strength.

We as a nation have come to take it for granted that the country will continue to have steady technological and economic growth and a secure position in the major ~~balance~~ of power in the world. ~~We rely on having both as we continue to work out, in our political processes, solutions to all these military, economic, and social problems.~~ But ~~let us always bear in mind that~~ today's world is a world of technology, and ~~the~~ space ~~program is a~~ major contributor ~~both~~ to our continuing technological growth and to our position ~~as a nation~~ in the world.

The technological advances stimulated directly and indirectly by a broadly based space program, which operates at the very frontiers of existing technology, set the pace for continuing national technological growth. And the capabilities developed in our aeronautics and space program give the nation real power. Large rockets and space vehicles, and the ability to control them accurately and fly them reliably, and advanced aircraft, these are products of technology which are among our most powerful and necessary tools in maintaining a position of national power in the world today.

Our continuing series of achievements in space and aeronautics is equally important as a symbol of power. For example, launches of the Saturn V in full public view at the very time they are taking place are powerful reminders to the whole world that the United States remains strong and capable.

There are long lead times involved. If we slow or stop the development of new technology at the source -- by unwise cuts in the space program, for example -- we are undercutting our technological and power position in the seventies. And then it will be too late to do anything about it.

In October we will mark the Tenth Anniversary of the National Aeronautics and Space Administration, a decade of accomplishment of which we can be extremely proud. In that period, our instrumented spacecraft have completely mapped the moon, analyzed its soil, taken the first close-up photographs of Mars, and given us valuable new information about Venus. They have given us scientific reports on the nature of interplanetary space, the relationships between the Sun and the Earth, and given us a new look at our old familiar planet from the perspective of space.

NASA astronauts have experienced almost 2,000 hours of space flight, a performance which remains unequalled to this day. And we are developing a manned space flight capability that will eventually enable us to travel wherever we want to go throughout the solar system.

The achievements of the first decade in space were made possible by a triangular team effort involving the creative abilities of our educational institutions, the

technological know-how of American industry, and the engineering and management capability provided by the government.

At the peak of this co-operative endeavor, some 420,000 persons were involved -- as many as were required to build our vast complex of transcontinental railroads. And we have passed the peak. We have already lost about 140,000 or more, and we are still losing them at the rate of about 4,000 a month. I would estimate that we are now down to about two-thirds of the maximum, and would expect a leveling off at about 60 percent of the high figure.

Because of the severe demands on the Nation's economy at home and abroad, the outlook for the next few years, or at least until the situation in Vietnam has been resolved, must be for sharply curtailed budgets, and for a much reduced program of new space missions to follow up and build on our completed projects.

NASA's 1969 authorization request, at the $4,370 million level, is $700 million below the amount requested last year. It does not, quite frankly, meet all our Nation's needs in

aeronautics and space. It is a compromise -- one which I fully support -- between needed work toward advances in aeronautics and space which we can and should make, and other over-riding requirements. The President has been forced, in spite of his conviction as to the importance of a larger effort, to accept reductions in NASA's budget as submitted for the current fiscal year, and to recommend in the upcoming budget an even lower level.

Thus, as we continue, one of our primary concerns is to preserve the strong scientific and technological base, and especially, the management capability, created over the past ten years. The most severe loss we can suffer is in trained personnel. NASA's program, primarily research and development, has never been oriented toward buying hardware in production-line quantities. Most of our dollars go into salaries and administrative support of people in science, government, and industry. Once a team is dispersed, it is difficult and expensive to reassemble it.

In a very real and literal sense, what we have put together, these fundamental building blocks for our successes in the air and in space programs, are vital national resources. These are the facilities, the technologies, the trained manpower and industrial know-how, and the university relationships that mean so much to the strength of a Nation.

The Nation's space program is advancing science and technology, and widespread applications are coming closer to fruition every day. It is laying the foundation for a wholly new field of human enterprise whose only limits are man's ingenuity and will to engage in it. The rewards -- if we do not falter -- promise to more than outweigh our investment, expensive as it may seem today when balanced against other needed expenditures. Indeed, Dr. Willard F. Libby, distinguished professor of chemistry at UCLA, said not long ago: "We have seen enough to know that this program is one of the best bargains the American people have ever made."

European experts who have studied the effects of space activity with sternly practical eyes have also arrived at this conclusion. Last year a well-known European finance minister -- Franz Josef Strauss of Germany -- estimated that every dollar America invested in its space program ten years ago is returning four dollars worth of value today.

American industry, by utilizing the improved technology generated by space programs, can now build better quality products, thus giving the customer increased value. The competitive position of American industry and the strength of the national economy is thereby improved. Quite recently, a report made by a study group of the National Academy of Sciences had this to say:

"The potential economic benefits to our society from space systems are enormous. They may amount to billions of dollars per year to many diverse elements of our industry and commerce and thus to the general public."

But let me give you a few practical examples. Here in North Carolina, where agriculture is so important, you

can appreciate the value of more accurate and longer-range weather prediction. Again according to the National Academy of Sciences' study group, this alone could be worth as much as a billion dollars a year, and that mineral riches revealed from space by specially instrumented spacecraft could amount to two billion dollars.

Already the U. S. space program has made possible a network of the world's first operational systems furnishing daily weather observation by satellites. This service is provided free to 45 other nations, from satellites operated by the Environmental Science Services Administration (ESSA) of the U. S. Department of Commerce.

United States communication satellites, developed by NASA, have added greater utility and versatility to communications between peoples. Live television coverage of important events such as the recent Winter Olympics from Grenoble, France, has become routine -- relayed across the ocean via satellite. And potential uses of communications satellites in the next few years are probably beyond our present ability to predict.

Through NASA's space research, we now understand better the nature and behavior of Earth's environment and its influence on our lives. With such knowledge, it will be possible to cope better with certain problems of living, and using our existing resources to best advantage.

For example, understanding the lower atmosphere and its behavior is especially vital now that smog and other pollution arising from industry and transportation elements are beginning to menace human health. Some of the greatest discoveries of space science have to do with this subject: rockets and satellites carrying instruments above the atmosphere detected the Van Allen belts, the Earth's dust cloud, the magnetosphere, and the subtle and not so subtle influences of the Sun on the Earth. This knowledge, and more that we are gaining almost daily, may help solve many problems.

The significance of the atmosphere to our lives is clear, but the interplanetary environment and the Sun have

a related importance. The Sun literally controls the state and behavior of Earth's atmosphere. NASA's Pioneer spacecraft have measured the Sun's energy in interplanetary space; our Orbiting Solar Observatories have given us new information on how the Sun's activity affects radio blackout, the Earth's weather, and other phenomena.

Space techniques also help in the study of land and water environments. I believe many of you will be interested in what we call the Earth Resources Program.

In agriculture, for example, we have been developing techniques and procedures to fly instruments, called remote sensors, in spacecraft, and with them to make rapid assessments of our forests, our range land, and our cultivated areas. From such assessments it will be possible to utilize and control our plant, soil, and water resources with increased efficiency.

Remote sensors in the form of special infrared cameras can serve as an excellent analytical tool in assessing crop damage, which is so often one of the world's most

serious agricultural problems. With this new technology our scientists can determine the condition of crops, detect diseased trees in a forest, or even give evidence of too much salinity in the soil.

Although this program is still in its early stages, it is attracting a great deal of interest both in this country and abroad. The U. S. Departments of Agriculture, Commerce, and Interior, among others, have been exploring with NASA the possibility of using manned and automated spacecraft to inventory and provide information on the status of Earth resources.

Recently the first cooperative international research program in this area has been undertaken by the United States, Brazil, and Mexico. The goal of the three-year program is to develop techniques for surveying natural resources -- for gathering data, for interpreting the data, and for using it. The signing of the agreement was hailed as the initial step in a promising new area for allying space research with social progress.

This cooperative undertaking in many ways epitomizes the true nature of NASA's complete role in space research and exploration. The role is one of service -- service to the community of science and technology, the community of industry, the community of agriculture, the community of other government agencies, and of other countries. In sum, then, service to the entire community of individuals whose personal investment of faith and resources makes the space program possible and worthwhile.

(UPDATE AFTER LAUNCH IF NECESSARY)

Yesterday we launched Apollo 6 -- another very important step toward our goal of providing this nation with the capability for large scale operations in space, a capability which we plan to demonstrate by landing men on the moon and bringing them back safely. We have designed, built, and tested some highly sophisticated launch vehicles and spacecraft. These Saturn launch vehicles and the Apollo

spacecraft are just now becoming operational. They should be useful to us throughout the next decade.

And that decade can be one of greater promise and greater return than the past 10 years. The opportunities that loom before are more momentous, more promising, more complex, and more challenging than were those that lay before us at the time of the sudden challenge posed to us by Sputnik I.

Last November 9 we checked out the Apollo spacecraft systems and tested the command module under the searing heat that the craft will be subjected to when it enters the Earth's atmosphere at a speed of 25,000 miles per hour on its return from the Moon.

After Apollo 6 will come a really crucial step -- the first test flight of a three-man crew of the Apollo spacecraft; we expect this to take place before winter.

Eight launches of the Saturn V are scheduled during 1968 and 1969. Then, as Dr. Wernher von Braun recently

remarked, "If all goes well, we shall meet the goal established in 1961 of landing men on the moon within this decade -- if we are not held up by having to pass through Russian customs."

All of these developing capabilities and events have deep meaning for our own times and for future generations. Already a change in attitude toward the future is clearly growing. In our own lifetimes we have experienced numerous major adjustments in our lives -- under the impact of the airplane, atomic power, missiles, and space exploration. The transistor, the computer, satellite communications, the laser, data processing, and a host of other technological developments are changing our environment as they add to our abilities to cope with it. Our children, even more than ourselves, will have to accept continual adaptation as a way of life.

Innovation will be the keynote as future generations learn to adapt to an environment of rapid change. The

whole future depends on the depth of our desire to know, to acquire new knowledge, to keep pressing outward the boundaries of our limited understanding and to press onward in our search for greater knowledge.